

WHAT IS CLAIMED IS:

1 An active pixel sensor comprising:  
2 at least one pixel comprising a photodetector that  
3 outputs an output level indicative of incoming light;  
4 a sample and hold element electrically connected to the  
5 pixel operating to store said output level during a readout  
6 operation;  
7 an adjusted saturated voltage source, comprising a node  
8 that provides an adjusted saturation voltage; and  
9 a comparator having a first input node operatively  
10 connected to the sample and hold element, a second input node  
11 electrically connected to the adjusted saturation voltage  
12 node, and an output node, said comparator operating to output  
13 a signal indicating whether the adjusted saturation voltage  
14 exceeds the output level from the photodetector.

1 2. The active pixel sensor of claim 1 further comprising a  
2 latch including an input node and an output node, said input  
3 node operatively connected to the output node of the  
4 comparator operating to store a saturation flag in response to  
5 the adjusted saturation voltage exceeding the output level  
6 from the photodiode.

1 3. The active pixel sensor of claim 2 further comprising a  
2 select transistor operatively connected to the output node of

the latch and operating to enable readout of the saturation flag during a readout operation for the pixel.

4. The active pixel sensor of claim 1 wherein the photodetector is a photodiode.

5. An active pixel sensor comprising:

at least one pixel comprising a photodetector;

a sample and hold element electrically connected to the pixel and operating to store a signal level on the photodetector during a signal readout operation;

an adjusted saturated voltage source, comprising a node that provides an adjusted saturation voltage; and

a comparator having a first input node operatively connected to the sample and hold element, a second input node electrically connected to the adjusted saturation voltage node, and an output node;

a latch electrically connected to the comparator output node, said latch operating to store a saturation flag in response to the adjusted saturation voltage exceeding the signal level;

a select transistor operatively connected to the output node of the latch operating to enable readout of the saturation flag during a readout operation for the pixel;

19 a differencing element electrically connected to the  
20 pixel and operating to produce a difference level from the  
21 signal level and a reset level output from the pixel during  
22 the pixel readout operation;

23 an analog-to-digital converter for converting the  
24 difference level into a difference digital value; and

25 a digital output selector comprising

26 a detector operatively connected to the latch output  
27 node,

28 an input node electrically connected to the analog-to-  
29 digital converter and an output node, and

30 a switch operating to switch the difference digital value  
31 on the output node to a maximum digital value in response to  
32 the detector detecting a saturation flag.

1 6. The active pixel sensor of claim 5, further comprising a  
2 plurality of pixels arranged in rows and columns.

1 7. The active pixel sensor of claim 6, wherein each column  
2 includes an analog-to-digital converter for converting the  
3 difference level into the difference digital value.

1 8. The active pixel sensor of claim 7, wherein the  
2 comparator is part of the analog-to-digital converter.

